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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,227	03/12/2004	Mark S. Kleefisch	37,275-00	8560
7590 BP America Inc. Docket Clerk, BP Legal, M.C. 5East 4101 Winfield Road Warrenville, IL 60555			EXAMINER HEWITT, JAMES M	
			ART UNIT 3679	PAPER NUMBER
			MAIL DATE 04/23/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/800,227

**Applicant(s)**

KLEEFISCH ET AL.

**Examiner**

JAMES M. HEWITT

**Art Unit**

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11, 13-17 and 26-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-17, 26-27, 29-33 is/are rejected.
- 7) ☒ Claim(s) 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 7-8, 10-11 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by White et al (US 6,547,286).

White et al disclose a joint assembly for joining a ceramic membrane to a tube sheet used in supporting the ceramic membrane within a reactor. The joint (1) connects a tubular ceramic element (2) to a tubesheet (3) to allow fluids to flow between side "A" of the tubesheet and the interior of the tubular ceramic membrane tube while isolating side "A" of the tubesheet from an opposite side "B". As shown in FIG. 3, the ceramic element includes a closed end and an opposite tapered end that is sealed via a sealing material to a tapered inner surface of the section (22) of seal housing (10). The sealing material can be a brazing material which is effected by known brazing techniques. As should be understood, brazing material is a metallic material, and the brazing process plastically deforms the brazing material. The seal housing is metallic

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and can be formed of suitable high temperature alloys such as HAYNES 230 alloy, HAYNES 214 or INCOLOY 800HT.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-6, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,547,286) in view of the article "FABRICATION OF CERAMIC-MEMBRANE TUBES FOR DIRECT CONVERSION OF NATURAL GAS" by Balachandran et al, published at the 1992 International Gas Research Conference.

White et al fail to explicitly teach that the ceramic membrane includes a ceramic material comprising a crystalline mixed metal oxide selected from a class of materials that have an X-ray identifiable crystalline structure based upon the structure of the mineral perovskite, and which exhibit at operating temperatures, electron conductivity, oxygen ion conductivity, and the ability to separate oxygen from a gaseous mixture containing oxygen and one or more components by means of the conductivities. Balachandran et al teach that such a ceramic material is useful in oxygen permeable membranes to produce value-added products. In view of Balachandran et al's teaching and since it has been held to be within the general skill of a worker to select a known material on the basis of its suitability for the intended use as a matter of obvious design

choice, it would have been obvious to one having ordinary skill at the time the invention was made to employ a ceramic membrane includes a ceramic material comprising a crystalline mixed metal oxide selected from a class of materials that have an X-ray identifiable crystalline structure based upon the structure of the mineral perovskite, and which exhibit at operating temperatures, electron conductivity, oxygen ion conductivity, and the ability to separate oxygen from a gaseous mixture containing oxygen and one or more components by means of the conductivities in White et al.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,547,286).

White et al discloses that the sealing material may be a brazing material. A variety of alloys of metals, including silver, tin, zinc and copper and others are well known and commonly used as filler for brazing processes. As such, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ one or more of silver, tin, zinc and copper in the brazing material in White et al.

Claims 26-27, 30 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,547,286) in view of Ueda et al (US 5,240,769).

As described in the above rejections of claims 1-3, 7-8, 10-11 and 14, White et al teaches all of the limitations of claims 26-27, 30 and 32 except that the girdle comprises a composite of graphite and a metallic material. Ueda et al teaches a packing material used for sealing two members, the packing material comprising a graphite sheet with

metal fibers interwoven (see claim 4) for example. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify White et al to include a graphite sheet packing with metal fibers in order to enhance the strength of the packing.

Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,547,286) in view of Ueda et al (US 5,240,769) as applied to claim 26 above, and further in view of the article "FABRICATION OF CERAMIC-MEMBRANE TUBES FOR DIRECT CONVERSION OF NATURAL GAS" by Balachandran et al, published at the 1992 International Gas Research Conference.

As described in the above rejection of claim 26, White et al/Ueda et al teach all the limitations of claims 29-31 except that the ceramic membrane includes a ceramic material comprising a crystalline mixed metal oxide selected from a class of materials that have an X-ray identifiable crystalline structure based upon the structure of the mineral perovskite, and which exhibit at operating temperatures, electron conductivity, oxygen ion conductivity, and the ability to separate oxygen from a gaseous mixture containing oxygen and one or more components by means of the conductivities. Balachandran et al teach that such a ceramic material is useful in oxygen permeable membranes to produce value-added products. In view of Balachandran et al's teaching and since it has been held to be within the general skill of a worker to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, it would have been obvious to one having ordinary skill at the time the invention

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was made to employ a ceramic membrane includes a ceramic material comprising a crystalline mixed metal oxide selected from a class of materials that have an X-ray identifiable crystalline structure based upon the structure of the mineral perovskite, and which exhibit at operating temperatures, electron conductivity, oxygen ion conductivity, and the ability to separate oxygen from a gaseous mixture containing oxygen and one or more components by means of the conductivities in White et al.

### ***Allowable Subject Matter***

Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

Applicant's arguments filed 11/30/07 have been fully considered but they are not persuasive.

Applicant state "Applicants disagree that White et al. teaches or suggests the use of a solid member, i.e., a girdle, and that such a girdle member is subject to plastic deformation upon application of differential pressure across the joint as claimed herein." and asserts "Brazing does not use a member, such as a girdle member as claimed, which is capable of plastic deformation upon being subjected to differential pressure across the joint being formed. The melting of solder or brazing material into a liquid form is not plastic deformation without rupture as claimed in the present invention."

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Examiner disagrees. White et al's sealing material (28) is conical and as shown in Figs. 3-8 is disposed between the outer surface of tubesheet and inner surface of the housing. Also, after brazing, White et al's sealing material is solid. As such, White et al's Sealing material, at least given the broadest reasonable interpretation, can be considered a girdle. Further, the claims do not require the girdle be capable of plastic deformation upon being subjected to differential pressure across the joint being formed, as asserted by Applicant. The claims require the girdle to be of a metallic material which is capable of undergoing deformation without rupture. White et al's sealing girdle (28), which can be brazing material, is made of such a material.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES M. HEWITT whose telephone number is (571)272-7084.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Stodola can be reached on 571-272-7087. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James M Hewitt/  
Primary Examiner, Art Unit 3679